

Ward Valley Groundwater Basin

- Groundwater Basin Number: 7-03
- County: Riverside, San Bernardino
- Surface Area: 961,000 acres (1,500 square miles)

Basin Boundaries and Hydrology

This groundwater basin underlies Ward and Danby Valleys in southern San Bernardino County. The basin is bounded by nonwater-bearing rocks of the Old Woman Mountains on the west, of the Piute Mountains on the northwest, of the Turtle and Stepladder Mountains on the east, of the Sacramento Mountains on the northeast, and of the Iron Mountains and by an unnamed fault on the southwest (Bishop 1963). The valley is drained by Homer Wash to Danby (Dry) Lake (Bishop 1963). Average annual precipitation ranges from 4 to 8 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the basin is found in alluvium, fan deposits, and playa deposits. These materials can reach near 2,000 feet thick, and well yields in this basin range from about 10 to 260 gpm (Committee 1995).

Alluvium. Alluvium of Holocene to Pleistocene age consists of unconsolidated to well-sorted, fine- to coarse-grained sand, pebbles, and boulders with variable amounts of silt and clay (DWR 1967).

Fan Deposits. Fan deposits of Pleistocene age are composed of gently tilted unconsolidated to moderately consolidated and moderately well bedded gravel, sand, silt, and clay. Fan deposits of Holocene age consist of poorly sorted gravel derived from the local mountains (DWR 1967).

Playa Deposits. Playa deposits of Holocene age are composed of clay with some sand, silt, and various amounts of soluble salts. Danby Lake is a discharging playa in the basin, having water levels at or near land surface (DWR 1967).

Restrictive Structures

An unnamed southeast-trending fault bounds the southwest portion of the basin; however, it is not known whether or not this fault impedes groundwater flow.

Recharge Areas

Recharge to the basin is from percolation of runoff from surrounding mountains through alluvial fans and washes (DWR 1967; Committee 1995). Subsurface flow from adjoining basins may also contribute to recharge (DWR 1967).

Groundwater Level Trends

Water level measurements made between 1910 and 1965 indicate that no significant decline has occurred in the basin over that period (DWR 1967).

Groundwater levels range from near the surface at Danby Lake to over 700 feet below the surface (Committee 1995).

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity is estimated at 8,700,000 (DWR 1975).

Groundwater in Storage. Unknown.

Groundwater Budget (Type A)

Natural recharge is estimated at about 2,700 af/yr (DWR 1975). Groundwater extractions in 1952 are estimated to have been about 2 af (DWR 1975).

Discharge at Danby Lake is estimated to range from 11,000 af/y (Law/Crandall 1992) to 22,000 af/yr (Committee 1995).

Groundwater Quality

Characterization. In the northern part of the basin, groundwater is sodium bicarbonate character, and TDS content ranges from 300 to 500 mg/L (DWR 1954; Committee 1995). In the southern part of the basin near Danby Lake, groundwater is sodium chloride character and has high TDS content (DWR 1954). Analyses of 16 wells in the basin show an average TDS content of 149,181 mg/L with a range of 475 to 321,000 mg/L (DWR 1967).

Impairments. Sulfate, chloride, fluoride, and TDS content levels may be very high in the basin (DWR 1967; DWR 1975). Saline water is present near Danby Lake (DWR 1954, 1975).

Well Production characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range: to 260	Average: 180 (DWR 1975)
Total depths (ft)		
Domestic		
Municipal/Irrigation		

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater levels	NKD
	Miscellaneous water quality	NKD
Department of Health Services and cooperators	Title 22 water quality	1

Basin Management

Groundwater management:

Water agencies

Public

Private

References Cited

- Bedinger, K. A. Sargent, and W. H. Langer. 1989. Studies of the Geology and Hydrology of the Basin and Range Province, Southwestern United States, for Isolation of High-Level Radioactive Waste- Characterization of the Sonoran Region California. United States Geological Survey Professional Paper 1370-E. 30 p.
- Bishop, C. C. 1963. Geologic Map of California, Needles Sheet. Single Map Sheet, Scale 1:250,000.
- California Department of Water Resources (DWR). 1954. Ground Water Occurrence and Quality, Colorado River Basin Region. Water Quality Investigations Report No. 4. 59 p.
- _____. 1967. Water Wells and Springs in Bristol, Broadwell, Cadiz, Danby, and Lavic Valleys and Vicinity. San Bernardino and Riverside Counties, California. Bulletin No. 91-14.
- _____. 1975. California's Ground Water. Bulletin 118. 135 p.
- Committee to Review Specific Scientific and Technical Safety Issues Related to the Ward Valley California Low-Level Radioactive Waste Site. 1995. Ward Valley: An Examination of Seven Issues in Earth Sciences and Ecology. Washington: National Academy Press.
- Law/Crandall. 1992. Water Resources Evaluation, Ward Valley, San Bernardino County, California. Consultant's report prepared for the City of Needles.

Additional References

- Bassett, A. M., Kupfer, D. H., and Barstow, F.C. 1959. *Core Logs from Bristol, Cadiz, and Danby Dry Lakes, San Bernardino County, California*. U. S. Geological Survey Bulletin 1045-D.

Errata

Changes made to the basin description will be noted here.